Global Warming & Your Food

A Publication of the Cool Foods Campaign
A Joint Project of the Center for Food Safety and the CornerStone Campaign

FROM FIELD TO FEEDLOT TO FORK: THE IMPACTS OF MEAT AND DAIRY ON GLOBAL WARMING

IT TURNS OUT that eating your veggies can do more for the planet than you may think. According to the United Nations, animal production is one of the "most significant contributors to the most serious environmental problems, at every scale from local to global."[1]

The United States is among the top producers of greenhouse gases that contribute to global warming, and our seemingly insatiable appetite for meat, poultry, and dairy is one big reason why. Though we make up less than 5% of the world's population,[2] Americans consume 15% of the world's meat.[3] Every year the U.S. livestock industry[4] produces over 33 million beef cows, more than 60 million pigs, nearly 9 billion chickens,[5] and 9 million dairy cows that produce over 185 billion pounds of milk.[6] Americans are famous for their love affair with the car, but did you know that our love of meat and dairy products contributes more than our automobiles to global warming? From field to feedlot to fork, animal production accounts for about 18% of ***all*** greenhouse gas emissions globally—more than emissions from transportation.[7]

Hogging All Our Crops

Animal production contributes to global warming throughout every stage of production. Raising animals requires a significant amount of fossil fuel energy to grow crops, operate on-farm equipment and machinery, transport animals between fields, feedlots and slaughterhouses, and process, package and distribute meat and dairy products. The amount of energy required to produce this protein is inefficient and energy intensive, especially given the amount of crops that are grown to feed the animals. Certain animal products like beef and lamb require far more inputs and energy than poultry, making their "FoodPrint" much higher.[8] Switching from industrial systems to more sustainable production techniques including organic and pasture-based systems can make a dramatic difference on global warming.

Most cattle in the U.S. usually begin their lives in pasture but are transported to industrial feedlots to finish their lives eating crops like soybeans and corn rather than grass. As a result, about half of the grain and oilseeds grown in the U.S. are fed to livestock.[9, 10] Growing crops like corn and soy conventionally to feed animals produces greenhouse gas emissions through the use of pesticides, fertilizers, machinery and transportation, not to mention countless acres of farmland that could otherwise be used to grow food for people. Every year in the U.S., growing corn and soybeans—the main ingredients in animal feed—requires almost 270 million pounds of pesticides[11, 12] and more than 21 billion pounds of synthetic fertilizer[13, 14] which produce vast amounts of greenhouse gas emissions in their production, transportation and application.

Pasture to Plate vs. Factory to Fork—a Big Difference

Animals that are "grass-fed", or produced using organic methods, produce significantly fewer greenhouse gas emissions than conventionally raised animals. Aside from being more humane by allowing animals to feed on their natural grass diet and move freely, these systems typically require less synthetic inputs and energy to operate than industrial facilities.[15, 16] Grain-fed beef—animals raised in feedlots[17]—requires twice as many energy inputs compared to grass-fed beef.[18] USDA-certified grass-fed animals cannot be fed grain or grain byproducts and must have continuous access to pasture during the growing season.[19] While some animals, like chickens or pigs, do not eat grass and may rely on feed crops, if raised organically the animals are fed 100% organic feed grown without synthetic pesticides and fertilizers. As a result, organic meat and dairy products result in significantly fewer greenhouse gas emissions than conventional meat and dairy.[20]

The U.S. produces about 9 billion animals for food every year, many of which are raised in "concentrated animal feeding operation" (CAFOs) or factory farms. These industrial facilities are very different than the rolling green hills many believe animals spend their time in.

MAIN OFFICE: 660 Pennsylvania Ave., SE, Ste 302, Washington, DC 20003 ▲ WEST COAST: 2601 Mission St., Ste 803, San Francisco, CA 94110
www.coolfoodscampaign.org

CAFOs are designed to produce the largest quantity of meat in the least amount of time, and crowd thousands of animals into extremely small spaces to eat, sleep, and defecate.[21] CAFOs and feedlots exacerbate greenhouse gas emissions because of their intensive use of energy and machinery and the way animals and their manure are managed. It is estimated that up to 58% of all greenhouse gas emissions from agriculture are the result of emissions from the management practices used on farms, including soil and manure management, machinery and equipment and methane emissions from cattle.[22]

Manure—The Foul Facts

All grazing animals—especially cows— emit methane, a powerful greenhouse gas, from their intestines as a natural by-product of their digestive process. While the gas is natural, the manure produced by the 95 million cows in the U.S. is a massive environmental burden that contributes heavily to global warming. CAFOs "tend to produce more manure than can be used as fertilizer on nearby cropland."[23] The manure produced by animals is three times the amount produced by humans.[24] Improper manure storage on CAFOs may increase greenhouse gas emissions because waste is often pooled in large lagoons and holding ponds. Prone to bursting and leaking, lagoons and ponds can be as large as 20 acres and 15 feet deep, containing up to 25 million gallons of manure.[25, 26] "During storage time, manure decomposes, and gaseous by-products are released,[27] including hydrogen sulfide (H2S), carbon dioxide, ammonia and methane."[28] In 2007, the U.S. Environmental Protection Agency reported that livestock manure is responsible for over 50 million tons of greenhouse gas emissions, mostly in the form of methane, which is 23 times more potent than carbon dioxide, and nitrous oxide, which itself is 296 times more potent than carbon dioxide.[29]

What You Can Do: Reducing Your Carbon FoodPrint

For people who choose to eat meat and dairy products, reducing your consumption of animal foods is the most effective way to reduce your Carbon "FoodPrint." According to a recent study, nearly 60% of greenhouse gas emissions from food are from meat, poultry, eggs, fish and dairy.[30] One study demonstrated that the fossil fuel requirements of an omnivorous diet were more than twice that of a vegetarian and seven times greater than a vegan.[31] Every meal makes a difference, so you can begin by switching to a veggie option once a week.

Changing the type of meat you eat can also make a big difference. Beef and lamb require by far the greatest amount of energy while poultry, dairy or pork requires far fewer energy inputs. Regardless of any animal product you buy, choosing organic will ensure that your food was made without synthetic fertilizers and pesticides, growth hormones, irradiation, genetic engineering, cloned animals, or sewage sludge. Locally-sourced meat and dairy travels far less than a typical conventional animal product and may require less processing. Choosing grass-fed beef and dairy over conventional grain-fed products reduces emissions because grass-fed systems don't require pesticide- and fertilizer-heavy corn and soy crops for feed[32] and sustainable manure management practices are usually in place.

So make your mother proud and eat your veggies—who knew that eating cooler could be so simple? There may still be a place in your diet for that hamburger too; but, if you choose to eat it, make sure it's organic, grass-fed and local to reduce your "FoodPrint" and ensure that we can all breathe a little easier.

For more on what you can do to lower your FoodPrint visit the Cool Foods Campaign website at www.coolfoodscampaign.org

---

[1] Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, de Haan, C (2006). *Livestock's Long Shadow- Environmental Issues and Options*. Food and Agriculture Organization of the United Nations.

[2] Food and Agriculture Organization of the United Nations (2007). *Meat Consumption*. FAOSTAT. http://faostat.fao.org/site/345/default.aspx

[3] U.S. Census Bureau. *International Database*. http://www.census.gov/ipc/www/idb/

[4] The livestock industry refers to farms and factories that produce cattle, pigs, poultry, sheep, eggs and dairy in the United States.

[5] U.S. Department of Agriculture (2002). *Census of Agriculture*. National Agricultural Statistics Service.

[6] U.S. Department of Agriculture (2007). *Milk Cows and Production*. National Agricultural Statistics Service. http://www.nass.usda.gov/QuickStats/index2.jsp

[7] Id, supra, note 1.

[8] Pimentel D, Pimentel M, (eds.) (2008). *Food, Energy, and Society: Third Edition*. CRC Press: Boca Raton.

[9] U.S. Department of Agriculture. Feed Grains Database: Yearbook Tables. Economic Research Service. http://www.ers.usda.gov/Data/Feedgrains/StandardReports/YBtable4.htm

[10] U.S. Department of Agriculture. Oil Crops Yearbook. Economic Research Service. http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1290

[11] USDA. (2006). *Agricultural Chemical Usage: 2005 Field Crops Summary*. National Agricultural Statistics Service.

[12] USDA. (2007). *Agricultural Chemical Usage: 2006 Field Crops Summary*. National Agricultural Statistics Service.

[13] Id, supra, note 11.

[14] Id, supra, note 12.

[15] Id, supra, note 1.

[16] Heitschmidt RK, Vermeire LT, Grings EE (2004) *Is rangeland agriculture sustainable?* American Society of Animal Science. 82(E.Suppl) :E138-E146.

[17] Feedlots refer to facilities where animals are fed high input diets consisting largely of conventional crops (mostly corn and soy) prior to their slaughter. Feedlots are typically very large and concentrate animals and their waste into small spaces that can exacerbate environmental pollution and greenhouse gas emissions.

[18] Id., supra, note 8.

[19] Id, supra, note 1.

[20] Pimentel, D (2004). *Livestock Production and Energy Use*. Encyclopedia of Energy.

[21] Food and Water Watch (2007). Turning Farms into Factories: How the Concentration of Animal Agriculture Threatens Human health, the Environment, and Rural Communities. http://www.foodandwaterwatch.org/food/pubs/reports/turning-farms-into-factories?searchterm=turning+farms+into+factories

[22] U.S. Environmental Protection Agency (EPA). (2008). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006. U.S. Environmental Protection Agency, Washington, D.C.

[23] Food and Agricultural Organization (2005). *Responding to the "Livestock Revolution"—The Case for Livestock Public Policies*. http://www.fao.org/ag/agaomfp/resources/documents/pol-briefs/01/EN/AGA01_10.pdf

[24] EPA (2007). USA EPA 2008 Compliance and Enforcement: Clean Water Act. pp. 1-3.

[25] Marvin D, (2005) *Factory Farms Cause Pollution Increases*. Johns Hopkins University Newsletter. http://media.www.jhunewsletter.com/media/storage/paper932/news/2005/02/04/Science/Factory.Farms.Cause.Pollution.Increases-2243919.shtml

[26] Schlosser E, Charles W (2006), *Chew On This* .Houghton Mifflin Company: New York.

[27] Id, supra, note 9.

[28] Cyr D, Steven J (2007). *Barn and Manure Storage Safety Bulletin*. University of Maine Cooperative Extension. http://www.umext.maine.edu/onlinepubs/htmpubs/2304.htm

[29] Id, supra, note 23.

[30] Weber C, Matthews HS (2008) *Food-Miles and the Relative Climate Impacts of Food Choices in the United States*. Env. Sci. Tech. 42: 3508–3513 http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2008/42/i10/abs/es702969f.html

[31] Baroni L, Cenci L, Tettamanti M, Berati M. (2007) *Evaluating the environmental impact of various dietary patterns combined with different food production system*. European Journal of Clinical Nutrition. 61: 279-286.

[32] Koneswaran G, Nierenberg, D. (2008) *Global Farm Animal Production and Climate Change*. Env. Health Pers. 116:578-582.